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In the Claims

MAR 17 2009

## 1-4. (cancelled)

5. (currently amended) A method of curing a composition comprising applying the composition to a three-dimensional substrate and curing by plasma in a plasma discharge chamber wherein the composition comprises (d) and either

- (a) at least one free-radical-polymerisable compound or
- (b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or
- (c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or
- a mixture of components (a) and (b), or
- a mixture of components (a) and (c);

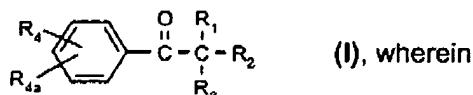
and wherein

(d) is at least one photolatent compound that is activatable by plasma discharge;

wherein

~~the composition is applied to a three-dimensional substrate and  
the curing is carried out in a plasma discharge chamber~~

wherein component (d) in the composition is at least one compound selected from the group consisting of formula I, II and IV

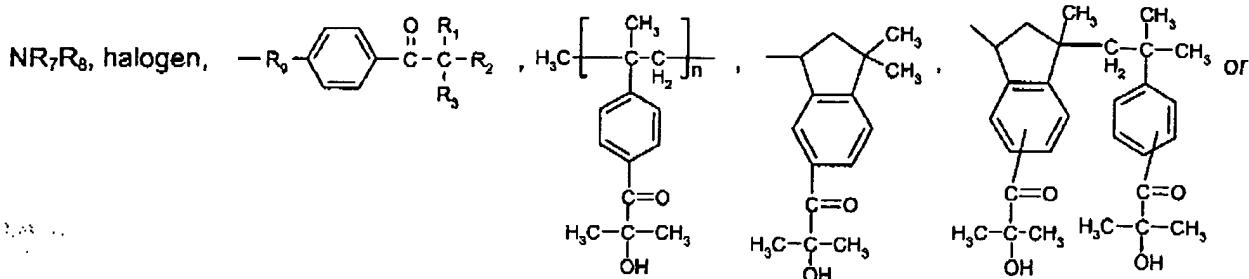


R<sub>1</sub> is C<sub>1</sub>-C<sub>12</sub>alkyl or C<sub>1</sub>-C<sub>12</sub>alkoxy;

R<sub>2</sub> is phenyl, OR<sub>5</sub> or NR<sub>7</sub>R<sub>8</sub>;

R<sub>3</sub> has one of the definitions given for R<sub>1</sub> or is C<sub>3</sub>-C<sub>12</sub>alkenyl, phenyl-C<sub>1</sub>-C<sub>6</sub>alkyl or C<sub>1</sub>-C<sub>6</sub>alkyl-phenyl-C<sub>1</sub>-C<sub>6</sub>alkyl;  
or R<sub>1</sub> and R<sub>3</sub>, together with the carbon atom to which they are bonded, form a cyclohexyl ring;  
R<sub>2</sub> being phenyl when R<sub>1</sub> and R<sub>3</sub> are both alkoxy;

**R<sub>4</sub>** and **R<sub>4a</sub>** are each independently of the other hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>hydroxyalkyl, OR<sub>6</sub>, SR<sub>6</sub>,

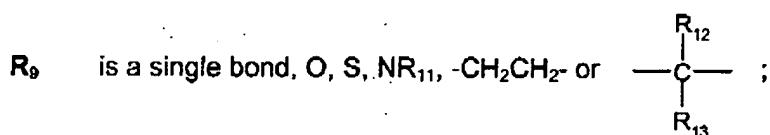


a monovalent linear or branched siloxane radical;

**n** is a number from 1 to 10;

**R<sub>6</sub>** and **R<sub>8</sub>** are each independently of the other hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>alkenyl, phenyl, benzyl, Si(CH<sub>3</sub>)<sub>3</sub> or —[C<sub>a</sub>H<sub>2a</sub>X]<sub>b</sub>—R<sub>10</sub>;

**R<sub>7</sub>** and **R<sub>8</sub>** are each independently of the other hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl or C<sub>2</sub>-C<sub>5</sub>hydroxyalkyl, or **R<sub>7</sub>** and **R<sub>8</sub>**, together with the N atom to which they are bonded, form a 5- or 6-membered ring, which may also contain ring is either not further interrupted or is interrupted by one or more O atoms or a NR<sub>11</sub> group;

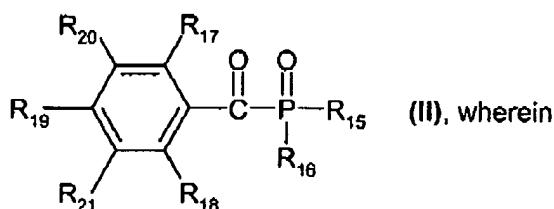


**a** and **b** are each independently of the other a number from 1 to 12;

**X** is S, O or NR<sub>11</sub>;

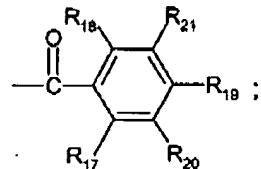


**R<sub>11</sub>** is hydrogen, phenyl, phenyl-C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>alkyl or C<sub>2</sub>-C<sub>5</sub>hydroxyalkyl; and **R<sub>12</sub>, R<sub>13</sub> and R<sub>14</sub>** are each independently of the others hydrogen or methyl;



**R<sub>15</sub>** and **R<sub>16</sub>** are each independently of the other C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>alkoxy; phenyl which is unsubstituted or substituted by one or more OR<sub>22</sub>, SR<sub>23</sub>, NR<sub>24</sub>R<sub>25</sub>, C<sub>1</sub>-C<sub>12</sub>alkyl or halogen substituents;

or R<sub>15</sub> and R<sub>16</sub> are biphenyl, naphthyl, phenyl-C<sub>1</sub>-C<sub>4</sub>alkyl or

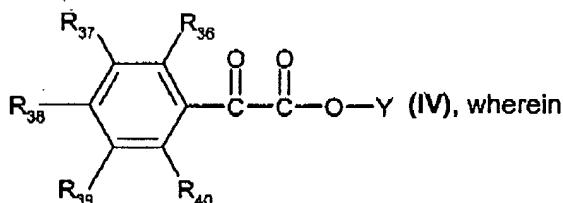


R<sub>17</sub> and R<sub>18</sub> are each independently of the other C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>alkoxy, CF<sub>3</sub> or halogen;

R<sub>19</sub>, R<sub>20</sub> and R<sub>21</sub> are each independently of the others hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>alkoxy, CF<sub>3</sub> or halogen;

R<sub>22</sub>, R<sub>23</sub>, R<sub>24</sub> and R<sub>25</sub> are each independently of the others hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>2</sub>-C<sub>12</sub>alkenyl, C<sub>3</sub>-C<sub>8</sub>cycloalkyl, phenyl, benzyl, or C<sub>2</sub>-C<sub>20</sub>alkyl which is interrupted by O atoms and is unsubstituted or substituted by OH or/and SH; or R<sub>24</sub> and R<sub>25</sub>, together with the N atom to which they are bonded, form a 5- or 6-membered ring, which may also contain O or S atoms or an NR<sub>26</sub> group; and

R<sub>28</sub> is hydrogen, phenyl, phenyl-C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>alkoxy, C<sub>1</sub>-C<sub>12</sub>alkyl or C<sub>1</sub>-C<sub>12</sub>hydroxyalkyl;



R<sub>36</sub>, R<sub>37</sub>, R<sub>38</sub>, R<sub>39</sub> and R<sub>40</sub> are each independently of the others hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl unsubstituted or substituted by OH, C<sub>1</sub>-C<sub>4</sub>alkoxy, phenyl, naphthyl, halogen, CN and/or by -OCOR<sub>41</sub>, or C<sub>2</sub>-C<sub>12</sub>alkyl which is interrupted by one or more O atoms, or R<sub>36</sub>, R<sub>37</sub>, R<sub>38</sub>, R<sub>39</sub> and R<sub>40</sub> are OR<sub>42</sub>, SR<sub>43</sub>, NR<sub>44</sub>R<sub>45</sub>, halogen, a monovalent linear or branched siloxane radical, or phenyl unsubstituted or substituted by one or two C<sub>1</sub>-C<sub>4</sub>alkyl or/and one or two C<sub>1</sub>-C<sub>4</sub>alkoxy substituents, it being possible for the substituents OR<sub>42</sub>, SR<sub>43</sub>, NR<sub>44</sub>R<sub>45</sub> to form 5- or 6-membered rings by way of the radicals R<sub>42</sub>, R<sub>43</sub>, R<sub>44</sub> and/or R<sub>45</sub> with further substituents on the phenyl ring or with one of the carbon atoms of the phenyl ring;

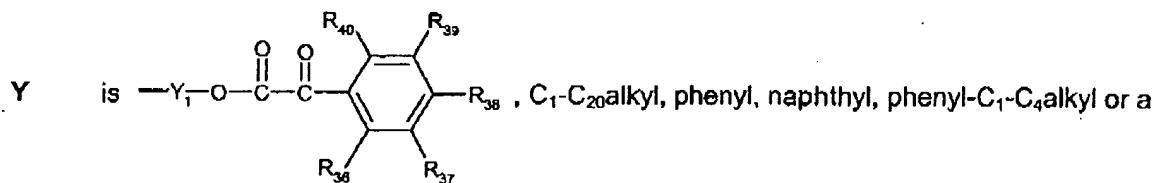
R<sub>41</sub> is C<sub>1</sub>-C<sub>8</sub>alkyl, or phenyl unsubstituted or substituted by from one to three C<sub>1</sub>-C<sub>4</sub>alkyl and/or one to three C<sub>1</sub>-C<sub>4</sub>alkoxy substituents;

R<sub>42</sub> and R<sub>43</sub> are each independently of the other hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl unsubstituted or substituted by OH, C<sub>1</sub>-C<sub>4</sub>alkoxy, phenyl, phenoxy or/and by -OCOR<sub>41</sub>, or C<sub>2</sub>-C<sub>12</sub>alkyl which is interrupted by one or more O atoms, or R<sub>42</sub> and R<sub>43</sub> are phenyl unsubstituted or substituted by C<sub>1</sub>-C<sub>4</sub>alkoxy, phenyl or/and by C<sub>1</sub>-C<sub>4</sub>alkyl, or R<sub>42</sub> and R<sub>43</sub> are C<sub>3</sub>-C<sub>8</sub>alkenyl, cyclopentyl, cyclohexyl or naphthyl;

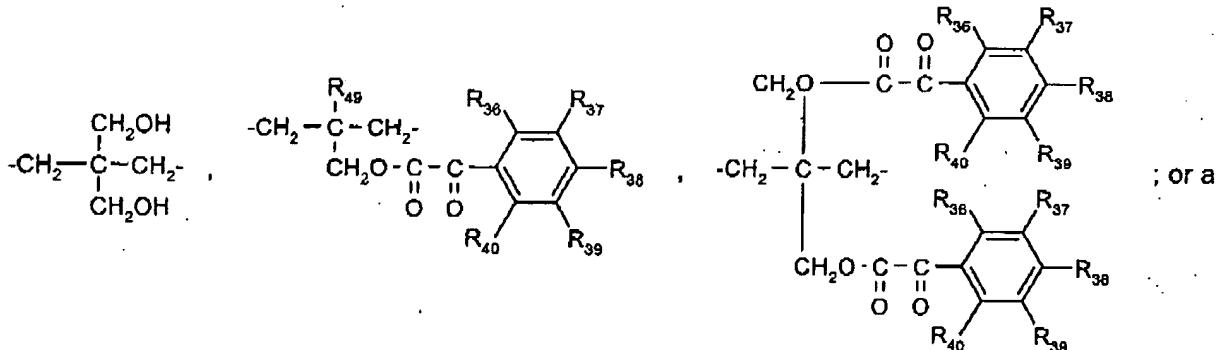
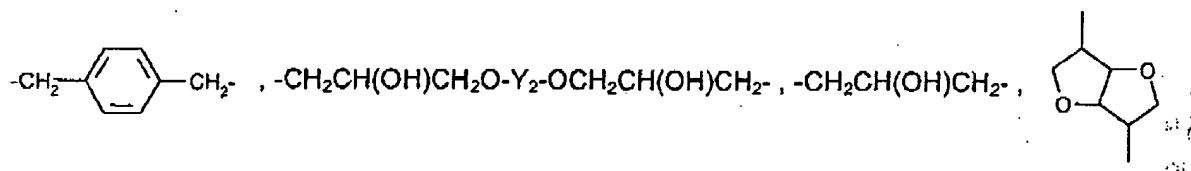
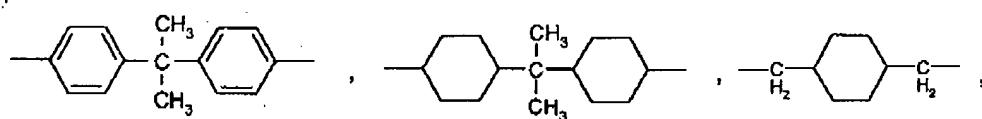
$R_{44}$  and  $R_{45}$  are each independently of the other hydrogen,  $C_1$ - $C_{12}$ alkyl unsubstituted or substituted by OH,  $C_1$ - $C_4$ alkoxy or/and by phenyl, or  $C_2$ - $C_{12}$ alkyl which is interrupted by one or more O atoms, or  $R_{44}$  and  $R_{45}$  are phenyl,  $-COR_{41}$  or  $SO_2R_{46}$ , or  $R_{44}$  and  $R_{45}$ , together with the nitrogen atom to which they are bonded, form a 5-, 6- or 7-membered ring, which may also be interrupted by  $-O-$  or  $-NR_{47}-$ ;

$R_{48}$  is  $C_1$ - $C_{12}$ alkyl, phenyl or 4-methylphenyl;

$R_{47}$  is hydrogen,  $C_1$ - $C_8$ alkyl unsubstituted or substituted by OH or by  $C_1$ - $C_4$ alkoxy, or is phenyl unsubstituted or substituted by OH,  $C_1$ - $C_4$ alkyl or by  $C_1$ - $C_4$ alkoxy;



$Y_1$  is  $C_1$ - $C_{12}$ alkylene,  $C_4$ - $C_8$ alkenylene,  $C_4$ - $C_8$ alkynylene, cyclohexylene,  $C_4$ - $C_{40}$ alkylene interrupted by one or more  $-O-$ ,  $-S-$  or  $-NR_{48}-$ , or is phenylene or  $Y_1$  is a group



divalent linear or branched siloxane radical;

$Y_2$  has the same definitions as  $Y_1$  with the exception of the formula

$-CH_2CH(OH)CH_2O-Y_2-OCH_2CH(OH)CH_2-$ ;

$R_{48}$  is hydrogen,  $C_1$ - $C_{12}$ alkyl or phenyl; and

$R_{49}$  is hydrogen,  $CH_2OH$  or  $C_1$ - $C_4$ alkyl.

**6. (previously presented)** A method according to claim 5, wherein component (d) in the composition is at least one compound selected from the group consisting of formula I and II.

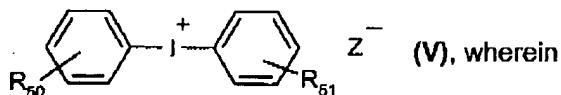
**7. (currently amended)** A method of curing a composition comprising applying the composition to a three-dimensional substrate and curing by plasma in a plasma discharge chamber wherein the composition comprises (d) and either

- (a) at least one free-radical-polymerisable compound or
- (b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or
- (c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or
- a mixture of components (a) and (b), or
- a mixture of components (a) and (c); and

wherein

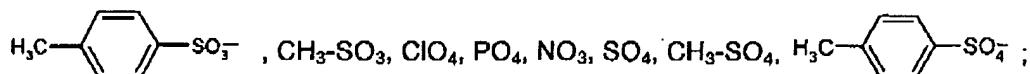
(d) is at least one photolatent compound that is activatable by plasma discharge;  
wherein

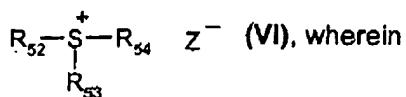
the composition is applied to a three-dimensional substrate and  
the curing is carried out by plasma discharge in a plasma discharge chamber wherein component (d) in the composition is at least one compound selected from the group consisting of formula V, VI, VII and VIIa



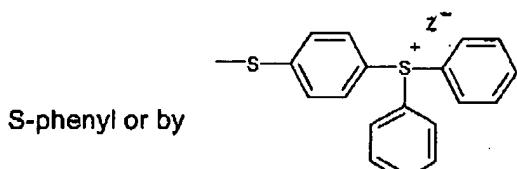
$\text{R}_{50}$  and  $\text{R}_{51}$  are each independently of the other hydrogen,  $C_1$ - $C_{20}$ alkyl,  $C_1$ - $C_{20}$ alkoxy, OH-substituted  $C_1$ - $C_{20}$ alkoxy, halogen,  $C_2$ - $C_{12}$ alkenyl, cycloalkyl, especially methyl, isopropyl or isobutyl; and

$\text{Z}$  is an anion, especially  $\text{PF}_6^-$ ,  $\text{SbF}_6^-$ ,  $\text{AsF}_6^-$ ,  $\text{BF}_4^-$ ,  $(\text{C}_6\text{F}_5)_4\text{B}$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{HSO}_4^-$ ,  $\text{CF}_3\text{SO}_3^-$ ,  $\text{F}\text{SO}_3^-$ ,

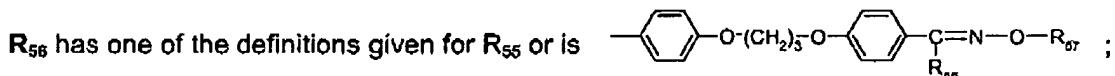
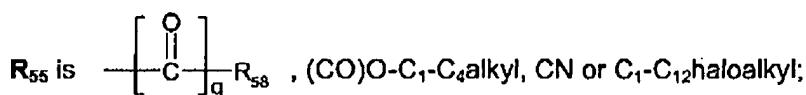
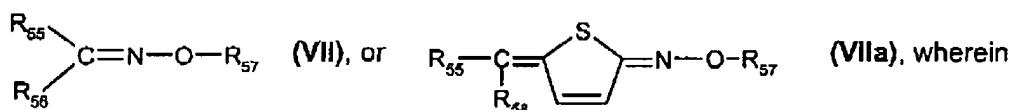




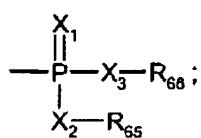
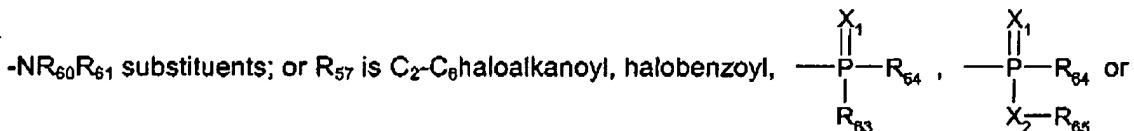
**R**<sub>52</sub>, **R**<sub>53</sub> and **R**<sub>54</sub> are each independently of the others unsubstituted phenyl, or phenyl substituted by –



**z** is as defined above;



**R**<sub>57</sub> is C<sub>1</sub>-C<sub>18</sub>alkylsulfonyl, C<sub>1</sub>-C<sub>10</sub>haloalkylsulfonyl, camphorylsulfonyl, phenyl-C<sub>1</sub>-C<sub>3</sub>alkylsulfonyl, C<sub>3</sub>-C<sub>30</sub>cycloalkylsulfonyl, phenylsulfonyl, naphthylsulfonyl, anthracylsulfonyl or phenanthrylsulfonyl, unsubstituted or substituted by one or more halogen, C<sub>1</sub>-C<sub>4</sub>haloalkyl, CN, NO<sub>2</sub>, C<sub>1</sub>-C<sub>16</sub>alkyl, phenyl, C<sub>1</sub>-C<sub>4</sub>alkylthio, C<sub>1</sub>-C<sub>4</sub>alkoxy, phenoxy, C<sub>1</sub>-C<sub>4</sub>alkyl-O(CO)-, C<sub>1</sub>-C<sub>4</sub>alkyl-(CO)O-, R<sub>67</sub>OSO<sub>2</sub>- and/or



**X**<sub>1</sub>, **X**<sub>2</sub> and **X**<sub>3</sub> are each independently of the others O or S;

q is 0 or 2; and

R<sub>58</sub> is C<sub>1</sub>-C<sub>12</sub>alkyl, cyclohexyl, camphoryl, unsubstituted phenyl, or phenyl substituted by one or more halogen, C<sub>1</sub>-C<sub>12</sub>alkyl, OR<sub>59</sub>, SR<sub>59</sub> or NR<sub>60</sub>R<sub>61</sub> substituents;

R<sub>59</sub> is C<sub>1</sub>-C<sub>12</sub>alkyl, phenyl, phenyl-C<sub>1</sub>-C<sub>4</sub>alkyl or C<sub>1</sub>-C<sub>12</sub>hydroxyalkyl;

R<sub>60</sub> and R<sub>61</sub> are each independently of the other hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>2</sub>-C<sub>6</sub>hydroxyalkyl, or R<sub>60</sub> and R<sub>61</sub>, together with the N atom to which they are bonded, form a 5- or 6-membered ring, which may also contain O atoms or an NR<sub>62</sub> group;

R<sub>62</sub> is hydrogen, phenyl, phenyl-C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>12</sub>alkyl or C<sub>2</sub>-C<sub>6</sub>hydroxyalkyl;

R<sub>63</sub>, R<sub>64</sub>, R<sub>65</sub> and R<sub>66</sub> are each independently of the others C<sub>1</sub>-C<sub>6</sub>alkyl, C<sub>1</sub>-C<sub>6</sub>haloalkyl; or phenyl unsubstituted or substituted by C<sub>1</sub>-C<sub>4</sub>alkyl or by halogen; and

R<sub>67</sub> is hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, phenyl or tolyl.

8. (cancelled)

9. (previously presented) The method according to claim 5, wherein the composition comprises, in addition to the photolatent component (d), other additives (h), sensitiser compounds (f) or/and dyes or pigments (g).

10. (previously presented) The method according to claim 9, wherein the composition comprises at least one light stabiliser or/and at least one UV absorber compound.

11. (previously presented) The method according to claim 5, wherein the composition is a surface coating.

12. (previously presented) The method according to claim 5, wherein the composition is a printing ink.

13. (previously presented) The method according to claim 5, wherein the composition comprises as polymerisable component solely free-radical-polymerisable compounds (a).

14. (previously presented) The method according to claim 13, wherein the free-radical-polymerisable compound comprises at least one compound selected from the group consisting of

mono-, di-, tri- or tetra-functional acrylate monomers and mono-, di-, tri- or tetra-functional acrylate-functional oligomers.

**15. (previously presented)** The method according to claim 5, wherein the composition comprises as polymerisable component solely cationically polymerisable or crosslinkable compounds (b).

**16. (previously presented)** The method according to claim 5, wherein the composition comprises as polymerisable component a mixture of at least one free-radical-polymerisable compound (a) and at least one cationically polymerisable compound (b).

**17. (previously presented)** The coated substrate which is coated on at least one surface by means of the method according to claim 5.

**18. (previously presented)** A coating obtained by a method according to claim 5.

**19. (previously presented)** A method of curing a composition comprising

(1) a combination of at least one electron acceptor maleimide compound and at least one electron donor vinyl ether compound; and

(2) optionally at least one free-radical-polymerisable compound (a),  
wherein the curing is carried out in a plasma discharge chamber.

**20. (previously presented)** The method according to claim 5 of curing a composition comprising

(a) at least one free-radical-polymerisable component having at least one ethylenically unsaturated double bond, the free-radical-polymerisable component optionally additionally being functionalised with OH, NH<sub>2</sub>, COOH, epoxy or NCO groups; and

(a1) a mixture of at least one compound selected from the group consisting of polyacrylates and polyester polyols,

and at least one compound selected from the group consisting of melamine, melamine derivatives and blocked or non-blocked polyisocyanates;

or

(a2) a mixture of at least one compound selected from the group consisting of carboxyl-, anhydride- or amino-functional polyesters and carboxyl-, anhydride- or amino-functional polyacrylates,

and at least one compound selected from the group consisting of epoxy-functional polyesters and polyacrylates;

or

(a3) a mixture of (a1) and (a2); and

(d) at least one photolatent compound of that is activatable by plasma discharge selected from the group consisting of formula I, II, and IV;

wherein

the curing of the composition is carried out in a plasma discharge chamber and, optionally, thermal pre- or after-treatment is carried out.

**21. (previously presented)** The method according to claim 5 of producing mouldings from composite materials, wherein a support is impregnated with the composition comprising

(a) at least one free-radical-polymerisable compound or

(b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

(c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or

a mixture of components (a) and (b), or

a mixture of components (a) and (c); and

(d) at least one photolatent compound that is activatable by plasma discharge selected from the group consisting of formula I, II, and IV;

and is introduced into a mould;

wherein the curing is carried out in a plasma discharge chamber and, optionally, thermal aftertreatment is carried out.

**22 27. (cancelled)**

**28. (previously presented)** The method according to claim 7, wherein the composition comprises, in addition at least one light stabiliser or/and at least one UV absorber compound and optionally other additives (h), sensitiser compounds (f) or dyes or pigments (g).

**29-37. (cancelled)**

38. (previously presented) The method according to claim 7, wherein the composition is a surface coating.

39. (cancelled)

40. (previously presented) The method according to claim 7, wherein the composition comprises as polymerisable component solely cationically polymerisable or crosslinkable compounds (b).

41. (previously presented) The method according to claim 7, wherein the composition comprises as polymerisable component a mixture of at least one free-radical-polymerisable compound (a) and at least one cationically polymerisable compound (b).

42. (previously presented) The method according to claim 7 of curing a composition comprising

(a) at least one free-radical-polymerisable component having at least one ethylenically unsaturated double bond, the free-radical-polymerisable component optionally additionally being functionalised with OH, NH<sub>2</sub>, COOH, epoxy or NCO groups; and

(a1) a mixture of at least one compound selected from the group consisting of polyacrylates and polyester polyols, and at least one compound selected from the group consisting of melamine, melamine derivatives and blocked or non-blocked polyisocyanates;

or

(a2) a mixture of at least one compound selected from the group consisting of carboxyl-, anhydride- or amino-functional polyesters and carboxyl-, anhydride- or amino-functional polyacrylates, and at least one compound selected from the group consisting of epoxy-functional polyesters and polyacrylates;

or

(a3) a mixture of (a1) and (a2); and

(d) at least one photolatent compound of that is activatable by plasma discharge selected from the group consisting of formula V, VI, VII and VIIa;

wherein

the curing of the composition is carried out in a plasma discharge chamber and, optionally, thermal pre- or after-treatment is carried out.

43. (previously presented) The method according to claim 7 of producing mouldings from composite materials, wherein a support is impregnated with the composition comprising

(a) at least one free-radical-polymerisable compound or  
(b) at least one compound that, under the action of an acid, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or  
(c) at least one compound that, under the action of a base, is able to enter into a polymerisation, polycondensation or polyaddition reaction, or  
a mixture of components (a) and (b), or  
a mixture of components (a) and (c); and  
(d) at least one photolatent compound that is activatable by plasma discharge selected from the group consisting of formula V, VI, VII and VIIa;  
and is introduced into a mould;  
wherein the curing is carried out in a plasma discharge chamber and, optionally, thermal aftertreatment is carried out.

44. (previously presented) A method of curing a composition according to claim 5 wherein (d) comprises at least one compound of formula I and one compound of formula II.